Restricted

NAVY DEPARTMENT

BUMED NEWS LETTER

a digest of timely information

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The Respective Merits of Whole Blood and Its Derivatives in Naval Medicine: With the increasing popularity and availability of blood and its derivatives, a short review of the indications and preferential use of these agents is in order.

Between whole blood, plasma and albumin, the determination of the therapeutic agent to be used in any given situation requires that many factors be considered. Transportation and storage space, stability of the agent, availability and necessity of sterilizing facilities and refrigeration demand consideration as do the merits of the agent with respect to the clinical needs of the patient. Since these factors will vary in each situation and the therapeutic agents available will vary accordingly, it is fortunate that with few exceptions the agents are reasonably interchangeable.

Dried plasma and human serum albumin (concentrated) are at present the only blood derivatives considered by the Subcommittee on Blood Substitutes of the National Research Council to be sufficiently stable to be recommended for shipment beyond continental limits. Neither should be frozen or subjected to excessive heat. If moderate temperature can be assured, i.e., 60° to 100°F., refrigeration is unnecessary. Albumin is chiefly supplied for those situations where transportation or storage space is at a premium.

Whole blood can be prepared for use by any activity possessing sodium citrate ampoules and sterilizing facilities. It has recently been suggested (Newhouser and Lozner, U.S. Nav. M. Bull. - in press) that, as long as it remains sterile and pyrogen-free, the empty water bottle from a recently used Standard Army-Navy Package of Dried Plasma forms an excellent receptacle for whole blood upon the addition of sodium citrate.

Although reasonably interchangeable as substitutes, the relative values of each of these therapeutic agents vary in different clinical conditions.

Plasma is indicated as an emergency measure in all conditions characterized by a reduced circulating blood volume. These include a number of situations:

Traumatic shock without hemorrhage: Here plasma is lost into the injured part; secondary shock develops with accompanying generalized capillary damage and

fluid loss. Plasma being the body's own colloidal fluid is ideal replacement therapy as its protein content and osmotic pressure are higher than that of extravascular fluid. Its addition tends to slow down and later reverse the plasma loss through the capillaries.

Traumatic shock with hemorrhage presents essentially the same mechanism except that in addition to plasma loss into the traumatized area, whole blood is lost outside the body. Even here the plasma loss is more important than the cellular loss. The body can function more adequately with a considerable reduction in the oxygen-carrying capacity than with a proportionate reduction in the circulating blood volume. Recovery from shock follows the use of plasma even when the patient's red blood count has been diluted to 1 or 2 million per cu. mm. The plasma serves to replace lost volume; however, if this is not followed by whole blood transfusions, the patient will continue to have a rapid pulse and convalescence will be prolonged.

Hemorrhage without shock is potentially hemorrhage with shock. For the reasons just outlined it should be treated as such. Hence plasma may be used satisfactorily as a first-aid measure but should be followed by whole blood as soon as the latter can be made available.

Burns, too, produce essentially the same pathological mechanism, as there is not only a loss of plasma into the burned area but later there develops a generalized loss of plasma. Therefore, plasma is needed to replace this loss, combating secondary shock and the accompanying hemoconcentration. Because of the increasing blood viscosity, whole blood is contraindicated during the first two to three days until the hemoconcentration is overcome. When anemia develops later, whole blood transfusions are indicated.

Hypoproteinemias due to inadequate synthesis of albumin (as in hepatic insufficiency) or to starvation or in the nephrotic syndrome are not strikingly influenced by plasma replacement which is only symptomatic therapy and does not influence the cause. However, in these conditions the intravenous administration of plasma provides a readily utilizable parenteral protein.

Concentrated Human Serum Albumin (25 Gm. in 100 c.c. of diluent - Standard package) representing the most osmotically active fraction of the plasma proteins, was prepared to meet a specific problem - that of having readily available a concentrated stable protein solution occupying a minimum of space. When injected, it quickly draws about four times its volume of fluid from the tissues into the circulating blood. Its uses in traumatic shock with and without hemorrhage, burns and hypoproteinemias are much the same as described for plasma with these exceptions: in the presence of severe dehydration alone or traumatic shock accompanied by dehydration, it is even more important when using albumin than when using plasma to supply extra fluids as there may be insufficient extravascular fluid for proper mobilization.

Especially in burns, long-continued use of albumin may diminish the content of prothrombin and other globulins. It should be supplemented after a day or two with plasma or (later) whole blood.

Being a single type of protein and available for immediate use, serum albumin has been useful in the management of hypoproteinemias resulting from cirrhosis,

nephrosis, starvation, and possibly nephritis. Occasional supplementary transfusions of blood or plasma supply valuable antibodies, prothrombin, etc.

Although a controversial point, it would seem that concentrated serum albumin, owing to its ability to draw fluid into the blood stream, is the agent of choice in the treatment of cerebral edema.

Whole blood is most desirable in situations where whole blood has been lost, as in hemorrhage or after the hemoconcentration has been overcome in burns. Only in the initial hemoconcentration following burns is whole blood contraindicated. It is most desirable also as symptomatic therapy in anemias and infections. In administering blood to patients with infections, it must be remembered that the antibody titre is influenced unfavorably by storage.

Red blood cells, which can be obtained as residue from plasma preparation and administered suspended in saline, are of value in conditions where, through loss of red cells or available hemoglobin, there is interference with oxygen transport. Examples of conditions where they would provide symptomatic relief are carbon monoxide poisoning and severe relapses of the chronic anemias. The life of the donated red cells in the recipient is shortened roughly in proportion to the length of storage of the cells before use. They are in no sense a substitute for whole blood in situations where the administration of albumin, prothrombin, antibodies, etc., would be of value.

Again it is urged that the questionnaires accompanying each package of plasma and albumin be filled out as completely as possible and returned to the Blood Research Division, Naval Medical School, National Naval Medical Center, Bethesda, Maryland. Only by an analysis of these questionnaires can the future program be planned. (LRN., S.T.G., E.L.L.)

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Burns: From carefully controlled studies and from experience, it is quite clear that no form of local application to thermic burns is superior in any respect to U.S.P. Petrolatum.

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Arsenical Reactions -- New Substance Effective in Treatment Is Now Available: As announced in the Bumed News Letter of June 11, 1943 (page 19), a new substance has been tried as treatment of arsenical reactions arising in the treatment of syphilis. This compound is now available for clinical trial. Its use should be limited to those cases so seriously ill as to endanger life (e.g. toxic encephalopathy, hepatitis, arsenical dermatitis, or blood dyscrasia). The material will be furnished in sterile ampoules ready for intramuscular injection. The suggested method of treatment consists of injecting the entire contents of an ampoule at three-hour intervals, four times during the first day, and once daily for the following six days.

Wherever feasible, it is important to collect 24-hour urine specimens on patients receiving this compound, beginning with the day before its administration, for quantitative estimation of arsenic.

Medical officers may, when occasion demands, request by despatch this detoxifying agent from the Bureau of Medicine and Surgery. The material will be forwarded with complete instructions for its use. The report form accompanying the instructions shall be completed and returned to the Bureau.

The despatch requesting this compound shall give diagnosis of the condition for which treatment is desired. (W.H.S.)

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Flash-Burn Ointment: An ointment for protection against flash burns has been developed at the Naval Medical Research Institute. The formula is confidential. It affords protection probably equal to or greater than that provided by the regulation undershirt.

It is intended for protection of the face, arms, neck and hands at stations where flash-proof clothing articles cannot readily be worn, but is not intended to replace anti-flash clothing now issued.

A sufficient quantity of this ointment will be issued for trial to selected ships in active areas in the South Pacific. Arrangements are being made to furnish it in containers permitting the issue to individuals of single applications.

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Present Status of Research on Motion Sickness: Motion sickness continues to be regarded as a serious problem in the armies of the United States and United Kingdom primarily because these organizations must consider the movement by sea or air of personnel not pre-selected for resistance to this disorder and often not habituated to the type of motion encountered. The American and British naval and air forces have not regarded this disorder as a serious problem primarily because personnel of vessels and of aircraft either develop sufficient tolerance by habituation, are discharged by medical survey or, in the case of air cadets, are dropped from flight training.

This general attitude, however, does not cover such situations as the following: (a) Seasickness is fairly common in naval personnel during the first few days of a voyage if the weather is rough or if, during a voyage, unusually rough weather is encountered. (b) Reports from Pensacola and other sources indicate that airsickness occasionally interferes seriously with the performance of navigators and other members of air crews during prolonged flights in rough air. Both training and tactical operations can be expected occasionally to require such flights. (c) A high incidence of motion sickness may occur in life rafts of naval vessels and aircraft.

Pre-selection of personnel highly resistant to motion sickness might be desired for special duties such as are required of air crew members, but no satisfactory way has been found to accomplish this end. Reaction to motion machines and replies to questionnaires regarding previous susceptibility to motion sickness have both been found to be correlated with susceptibility to sea and air sickness, but this correlation has not been sufficiently high to afford a satisfactory means of pre-selection. Even if a satisfactory method of pre-selection of resistant individuals were available, this would not solve the problem

because the great majority of persons can be expected to be affected in especially severe situations.

A more feasible approach to this problem is medication to reduce the incidence and severity of the disorder (a) during a period of a few hours when violent motion is expected or (b) during a day or more until habituation is established. Much research is being directed toward the discovery of a drug or combination of drugs which will serve this purpose without producing adverse side effects. The most satisfactory of these found thus far appears to be scopolamine (hyoscine). This drug, in dosage of 0.6 mg., has been administered to large numbers of subjects and seems to reduce the total morbidity from motion sickness by about 50 per cent.

Recent reports contain contradictory statements regarding the frequency and severity of undesirable side effects following administration of motion sickness preventives. Further work is being done in order to determine whether scopolamine or other motion sickness preventives have measurable adverse effects when taken in the usual dosage. Possible adverse effects of scopolamine include those on vision, on psychomotor coordination, and on mental function. If such effects occur, it must be considered whether they might outweigh the advantages to be gained by the use of these drugs in naval vessels or aircraft. An important limitation of this and numerous other drugs which have been investigated is that while they may prevent the appearance of motion sickness, they are relatively ineffective in relieving the syndrome after it has developed. Scopolamine reaches its greatest effectiveness about two hours after ingestion and its action continues for six to eight hours. Situations are scarcely conceivable when there would be two hours forewarning of the necessity of abandoning a surface craft or airplane.

It has been determined that any adverse effects of scopolamine are so slight as to offer no contraindication to its use in dosage of 0.6 mg. in life rafts of vessels and aircraft and also in the transportation of troops who will not be called upon for combat duty within eight hours after ingesting the drug. Such use of scopolamine has, accordingly, been authorized by naval, air and land forces of the United States and Great Britain, and supplies of scopolamine with directions for its use are now being incorporated in the emergency first-aid kits for life rafts of surface vessels and of aircraft of the U.S. Army and Navy.

If investigations now in progress indicate that scopolamine or other motion sickness preventives have negligible adverse side effects, the discretionary use of such drugs in naval vessels and aircraft may be authorized. (R.B.B.)

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Gas Masks Used in Diving: The U.S. Navy service gas mask has been found useful as an improvised face piece of shallow water diving outfits.

The conversion was arrived at independently at several places when the regulation Navy face mask was not available and there were jobs to be done in which the helmet type outfit imposed undesirable limitations on movements of the diver. Personnel tried the gas mask and found it a successful substitute.

From the USS HELENA, the USS CURTISS and the Pearl Harbor Navy Yard have come reports on the improvisation to the Bureau of Ships at the Navy Department,

which now has distributed the information to other ships and stations for possible use wherever need should arise. (Army and Navy Register, Sept. 18, '43.)

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Sulfamerazine: Hall and Spink report the result of their clinical evaluation of sulfamerazine.

Sulfamerazine is the monomethyl derivative of sulfadiazine. It is 2½ times as soluble in water as sulfadiazine. Its acetylated form has almost the same solubility as free sulfamerazine in water and is almost twice as soluble in water as acetylated sulfadiazine. Higher maximum blood levels can be established in white mice with sulfamerazine than with identical doses of sulfadiazine. The minimal lethal doses of sulfamerazine and sulfadiazine for white mice are about the same. Sulfamerazine is more soluble than sulfadiazine in urine both in the free and in the acetylated forms. Raising the pH of the urine from 6.5 to 7.5 greatly increases the solubility of all these compounds. Sulfamerazine is more slowly excreted in the urine than sulfadiazine and therefore appears in lower concentrations. The degree of acetylation is comparable to that of sulfadiazine. When sulfamerazine is administered to human subjects, it appears that adequate blood levels can be quickly attained without the necessity of giving the sodium salt intravenously and that such doses can be maintained by giving only 1 or 2 doses by mouth daily.

Hall and Spink treated 116 patients having a variety of infections in an effort to compare sulfamerazine with sulfadiazine with respect to their pharmacology, therapeutic effectiveness, and toxicity. Their conclusions are as follows:

Adequate blood concentrations can be maintained with smaller doses of sulfamerazine than with sulfadiazine. Because sulfamerazine is retained in the body for a longer period of time than sulfadiazine, doses of the former may be given at less frequent intervals. Sulfamerazine appears to be just as effective in the therapy of pneumococcic pneumonia as sulfadiazine. Sulfamerazine usually causes a more abrupt fall in temperature than occurs with sulfadiazine. Sulfamerazine appeared to be just as effective as sulfadiazine or sulfapyridine in the treatment of meningitis due to type B influenza bacillus or the meningococcus. Infections due to hemolytic streptococci responded quite satisfactorily to sulfamerazine, and in this respect the results are similar to those obtained with sulfadiazine. Sulfathiazole is more effective than either sulfamerazine or sulfadiazine in staphylococcic infections. Toxic reactions due to the drug were no more frequently encountered with sulfamerazine than with sulfadiazine. Sulfamerazine provoked fewer reactions than we had previously encountered with sulfathiazole, sulfapyridine or sulfanilamide. Although sulfamerazine and its acetylated forms are more soluble in urine than the comparable forms of sulfadiazine, two of the patients developed renal complications due to precipitation of the drug in the form of crystals within the urinary tract.

Recent investigations indicate that crystalluria due to sulfadiazine may be prevented, or at least reduced, by administering sufficient quantities of an alkali to maintain the pH of the urine at 7.5 or higher. To achieve such an alkaline urine when therapeutic doses of sulfadiazine are being utilized, it has been recommended that from 10 to 20 Gm. of sodium bicarbonate should be

administered in divided doses every twenty-four hours. It would appear that alkalization is a valuable prophylactic procedure also for patients receiving sulfamerazine.

It is recommended at the University Hospital that in patients receiving sulfadiazine or sulfamerazine, the fluid intake should be maintained so that the urinary output during a period of twenty-four hours ranges between 1,000 and 2,000 c.c. At the same time, enough sodium bicarbonate should be administered so that the pH of the urine is 7.5 or more. Obviously, such a procedure is carried out in patients whose clinical condition does not contraindicate it. This applies particularly to patients having renal dysfunction, or cardiac failure. It should be emphasized that renal complications due to sulfapyridine, sulfathiazole, sulfadiazine and probably sulfamerazine may be due to factors other than the precipitation of crystals. There is some evidence that renal failure may be associated with a direct toxic effect of the sulfonamides on the renal parenchyma and also to hypersensitivity phenomena. It is doubtful that alkalization would be of much benefit under such circumstances.

Sulfamerazine appears to be tolerated quite well by children and small infants. No toxic reactions were encountered in 15 infants under 1 year of age. (J.A.M.A., Sept. 18, '43.)

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The paper abstracted above is one of several that have appeared in the recent literature regarding preliminary experimental use of sulfamerazine. The various investigators are in general agreement regarding the facts presented.

Sulfamerazine compares favorably with sulfadiazine in therapeutic usefulness. There is evidence that in its oral use, effective blood levels can be attained more rapidly and sustained with smaller and more infrequent doses. It carries a lowered hazard with respect to the urinary tract, but the hazard is not eliminated.

Certain of the individual idiosyncrasies to the sulfonamides are specific for single members of the series. As some individuals may become sensitized to more than one of the drugs, it is of real advantage to have a number of available ones of approximately equal value. Sulfonamide fastness on the other hand in the light of recent evidence probably represents the resistance of an organism to the sulfonamide group as a whole, and if this is so, will not be circumvented by changing from one preparation to another.

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Jaundice Following Inoculation of Human Serum: During 1942, 11,358 individuals on the islands of St. Thomas and St. John, Virgin Islands, were inoculated with Lot 331 yellow fever vaccine containing pooled human serum. Fourteen and seven-tenths per cent of the vaccinated individuals developed hepatitis.

Among 159 persons who were said not to have been vaccinated, three cases occurred. As far as could be determined the incubation period varied between 75 and 130 days. So far as is known, no contact cases of jaundice occurred.

Oliphant et al were able to produce hepatitis in 24 per cent of 50 volunteers by inoculating them with this same yellow fever vaccine (which contained the human serum component). The hepatitis-producing factor in the vaccine was found to be filterable, to resist storage in wet serum for long periods at 4° C. and to resist heating in the dried state at 56° C. for a half hour. It was inactivated by ultra-violet irradiation.

Of even more interest is the fact that serum taken from (1) vaccinated individuals, (2) a vaccinated individual who later developed jaundice and (3) patients with hepatitis following yellow fever vaccination, could produce hepatitis in a significant number when inoculated into human volunteers. The serum taken from such an individual 2½ months after the jaundice had subsided had lost its ability to transmit hepatitis.

Attempts to transmit hepatitis to experimental animals and to develop a complement fixation test were unsuccessful. (Pub. Health Rep., Aug. 23, '43.)

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Carbon Monoxide Poisoning: In addition to its presence in artificial illuminating gas, carbon monoxide is formed whenever organic material is burned. It is thus almost universally present and is one of the commonest forms of accidental and suicidal poisoning. The source of the carbon monoxide may not be evident, in which case the diagnosis is likely to be overlooked. After survival for several hours most of the carbon monoxide is eliminated from the body, and the symptoms are likely to be misleading.

In rapidly fatal cases, such as may occur from the inhalation of illuminating gas or the exhaust gases from an automobile, there is a characteristic cherry-red discoloration of the skin, blood, and organs. When asphyxiation is more prolonged, numerous fine petechial hemorrhages are frequently found throughout the white matter of the brain. In patients surviving carbon monoxide poisoning for twenty-four hours or more a characteristic lesion occurs in the brain, a bilateral symmetrical softening or anemic necrosis of the globus pallidus. In delayed deaths this is the only consistent finding, although lesions in other organs may occasionally be found.

From a pharmacologic standpoint carbon monoxide is practically inert. It owes its toxic properties to the fact that it combines with hemoglobin, thus making it unavailable for the transport of oxygen. Every symptom of poisoning can be accounted for by the asphyxia thus produced. A reversible equilibrium exists in the blood between the proportions of oxy- and carboxyhemoglobin on one hand, and the partial pressures of oxygen and carbon monoxide on the other. But since the affinity of carbon monoxide for hemoglobin is about 210 times that of oxygen, the proportion of carboxyhemoglobin is relatively high.

Treatment consists in the administration of oxygen to promote the elimination of carbon monoxide and to supply oxygen to the tissues. Carbon dioxide is

given to stimulate respiration and promote the release of oxygen to the tissues. A mixture of 7 per cent carbon dioxide and 93 per cent oxygen is administered by means of a face mask, with artificial respiration when necessary. With the possible exception of caffeine, drugs have no place in the treatment of poisoning by carbon monoxide. In severe cases measures to combat shock are important. (N.Y. State J. Med., Sept. 1, '43.)

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Vitamin Loss in Sweat: Mickelsen and Keys studied the composition of sweat from various parts of the body of normal young men at rest and in moderate work.

They found that nicotinic acid was present in sweat in sufficient concentration (0.1 mg. per 100 c.c.) to be of possible significance. Thiamin, riboflavin, and ascorbic acid were not found in the sweat in sufficient concentration to suggest that significant amounts of these vitamins are lost from the body by this route. The authors conclude that with the possible exception of nicotinic acid, loss in sweat of vitamins in hot climates need not be taken into consideration in estimating replacement therapy. (J. Biol. Chem., Aug. '43.)

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The Treatment of Open Head Wounds: Experience has shown that the immediate treatment of open head wounds by the insertion of a petrolatum gauze pack and transfer of the case has been disastrous in some instances and unsatisfactory in many. Such treatment should be avoided. Writing of cases so treated in North Africa, Douglas Miller remarks (Australian & New Zealand J. Surg., 1942, 12, 53), "Several scalp wounds had been left open and packed with sulphonamide powder or 'vaseline' gauze. They all became infected, healed very slowly and prolonged the patient's convalescence by weeks."

Commenting on infected head wounds the same author states, "All these wounds appeared to have become infected by way of a persisting communication with an improperly healed external wound."---"Primary surgical treatment should be concentrated on the wound and the superficial part of the injured brain." Colonel Miller's observations bear out similar experiences which we have had in this country. Head wounds, like chest wounds, should be closed as soon as possible. General principles apply to their treatment, namely the arrest of hemorrhage and the prevention of infection at as early a stage as possible. A compound fracture of the skull is in this sense essentially similar to a compound fracture of a limb bone or any other bone. It should be converted into a simple closed fracture as soon as possible. If left long enough with a gauze pack in it, infection is bound to occur. An early toilet of the wound is therefore called for, the scalp being well cleansed, its edges pared, dirt and obviously damaged material, e.g. torn galea, bruised and soiled cortex, removed from the wound and the edges of the scalp incision approximated. It is not always possible to suture the galea separately from the scalp and cases have done quite well in which a single layer of sutures of waxed thread or silk, silkworm gut or nylon, have been used for the closure. If drainage is desirable, because of oozing, the heavily contaminated nature of the wound, or the fact that there has been a delay in carrying out this treatment, a piece of rubber glove or cellophane should be placed in one or more angles of the wound. No attempt is to be made to remove deeply placed pieces of

bone, or missile, or to carry out any procedure which is in any way likely to produce damage to the brain beyond that already inflicted on it by the head injury.

A recent case will serve to illustrate the principles here advocated. A young seaman was hit in the frontal region by a piece of cannon shell which produced a compound fracture and traversed almost the whole of the left hemisphere, coming to rest in the posterior part of the occipital lobe. The patient was landed and operated upon approximately ten hours after he had been hit - the wound being excised, superficial debris removed and a gauze pack placed in it. The consulting surgeon was called to see the case and arrived at the hospital twenty-four hours later. The patient was conscious and in good general condition but hemiplegic. He was taken to the operating theatre, the pack removed and the scalp closed over a hernia of contused cortex which no attempt was made to remove. A week later there was a cleanly healed scalp wound overlying a bone defect from which the cerebral hernia had receded. Had this wound not been closed, the patient would almost certainly have had a brain fungus by this time. No harm was done in this case, but the wound should have been closed in the first instance.

In conclusion, paragraphs 9 and 10 of "Some Practical Points in Treatment" (Lambert Rogers, Med. Press and Circular, 1943, 105, 4) may be quoted: "Sulphanilamide powder should be well dusted into the scalp wound prior to its closure, but should be only sparingly, if at all, used on the brain itself.

"If in doubt how much to do, we cannot go far wrong by merely turning a compound into a simple fracture, ignoring for the time being the brain injury, which can if necessary be treated at a later stage. It is important to close the scalp over a penetrating wound to prevent the formation of brain fungus." (Roy. Nav. M. Bull., #23.)

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Pathological Material, Collection and Shipment of Specimens: Ref. BuM&S Form Letter P3-4(041) dated April 15, 1943, reprinted in Bumed News Letter dated April 30, 1943.

The Naval Medical School is in urgent need of pathological material and specimens to be used for teaching purposes in connection with tropical or exotic diseases and other diseases of military importance.

All activities having suitable material are urged to forward it as soon as possible to the Medical Officer in Command, Naval Medical School, Bethesda, Maryland, in accordance with the above reference. (O.W.)

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Studies on Trichinosis: Wright, Kerr and Jacobs of the U.S.P.H.S. examined the diaphragms of 5,313 individuals coming to necropsy in 189 hospitals located in 114 cities in 37 States and the District of Columbia. Of these cases, 855, or 16.1 per cent, were positive for Trichinella spiralis. Omitting results of examinations in a series of 200 diaphragms from Jews, of which only one was

positive, the representative cases totaled 5,113, of which 854, or 16.7 per cent, were positive.

The examinations were divided into several series in accordance with the source of the material. These series included material comprising 3,000 cases from Washington, D. C., and five eastern seaboard cities, material from individuals in States in which clinical trichinosis had never been reported, material from persons suffering sudden natural death or traumatic death without hospitalization or with hospitalization for less than 24 hours, material selected at random in hospitals selected at random, material from individuals who had lived on farms or in villages of 1,000 population or less, and material from hospitals in the States of Washington and Oregon, and material from Jews.

The residence of individuals represented in the survey embraced 41 States and the District of Columbia. Included were 4,877 cases in which individuals resided in urban communities and 436 in which the persons came from rural areas.

There were no statistically significant differences in the percentage of positives obtained in the various series nor any difference in the incidence of trichinae in the urban and rural groups.

Of the 855 positive cases encountered in the total of 5,313, 733, or 85.7 per cent, had infections of less than 11 larvae per gram. A total of 4.5 per cent of the positive cases had infections more than 50 larvae per gram. It is believed that infections of this order are capable of causing pronounced clinical symptoms.

Infections with dead larvae predominated over infections with live larvae, and infections with live larvae predominated over those with mixed live and dead larvae.

The authors conclude that superimposed trichina infections occur in man, that a previous infection does not protect against acquisition of or death from a superimposed infection, and that not all cases of trichinosis are diagnosed either clinically or anatomically. (Pub. Health Rep., Aug. 27, '43.)

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Marble et al described an outbreak of trichiniasis occurring in May 1941, in a company of infantry at Camp Edwards. There were 13 cases of the disease. The other 142 men in the company who ate at the same mess hall remained clinically well. However, when blood smears of these men were examined ten days after the outbreak of the epidemic, 59 per cent had an eosinophilia of over 4 per cent and 30 per cent had an eosinophilia of over 10 per cent as compared with normal controls in which 17 per cent had more than 4 eosinophiles and 2 per cent had more than 10. (Mil. Surg., June '42.)

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The evidence presented by Marble and his co-workers suggests that many of those who become infested with trichinae do not develop the clinical disease trichiniasis and adds further support to the findings of Wright, Kerr and Jacobs noted above.

Developer for Fluorographic Films: After extensive experiments the following formula has been found optimal for this type work and is accordingly recommended by the Naval Medical School.

*Water 125° F.	500 c.c.
Elon	11 Gm.
Sod. Sulphite (anhyd.)	56 Gm.
**Alkanol B (sat. sol.)	8 c.c.
Water to make	1000 c.c.

*Distilled water best but not essential.
**Solubility of Alkanol B is 6 Gm. per 100 c.c. water.

Developing time: 35 minutes at 70° F. Higher temperature unsatisfactory as emulsion may be damaged due to length of developing time. At cool temperatures time may be extended to as much as 2 hours.

Films must be agitated constantly for first 2 minutes and once a minute thereafter.

Above formula gives fine grain development for orthochromatic and panchromatic film as follows: Ortho. 11 mins., Panchro. 13 mins. at 68° F.
(C.F.B. & H.F.A.L.)

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Psychological Type Prone to Accidents and Mistakes: Dunbar studied the histories and psychologic patterns of patients on the fracture service of a large civilian hospital. She found that about 80 per cent of the patients gave a history of "accident proneness." She believes that persons who have had one major accident are apparently those most likely to have other major accidents, unless the mechanical factor could be demonstrated conclusively, and that patients who have a history of a good many minor accidents are those most likely to have a major one.

Dunbar found that accident-prone individuals as a group belong to a fairly well-defined psychological pattern. In general, typical accident-prone individuals have excellent health records, rarely suffering from colds, indigestion, and "vegetative" symptomatology. These persons are apt not to finish educational courses they undertake, to leave school early, and to have an unstable work and income record. They are spontaneous and casual in social relations, may have superficially good sexual adjustment but are often irresponsible toward their sexual partners and family. Their basic tendencies are frequently strongly introversive. The accident-prone person is likely to be interested in machinery, sports, or gambling, but not in philosophy. He attaches emotion to immediate concrete experiences rather than to ideas, makes up his mind quickly, may use coffee, alcohol or cigarettes to relieve tension. He is unlikely to fight but reveals in his life history many conflicts with authority. Often he puts up with authority as long as he can, then attempts to escape by change of job or scene. His behavior is impulsive under stress. The accident habit seems to include a mistake habit. Accident-prone persons can make the kind of mistake that sinks a

ship, loses a battle or causes an explosion in a munitions plant, and the mistake will appear to be just the kind of unfortunate mistake that anyone might make. Nevertheless, there is evidence that certain types of people are more prone to make such mistakes. Such persons should be given special attention in placement and treatment. (War Med., Aug. '43.)

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Doctors Aweigh; The Story of the U.S. Medical Corps in Action is the title of a book by Rear Admiral Charles M. Oman (MC), U.S.N. recently published by Doubleday, Doran and Company, Garden City, N.Y.

The author has an excellent knack of story telling and introduces on a background of delightful narrative and anecdote an authentic and comprehensive picture of the activities of the Navy Medical Corps as he has seen it in forty years' service in peace and war. The book should prove of interest not only to members of the Medical Corps but to many other people. The technical parts of the book are in simple language so it should appeal to laymen as well as physicians.

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Alcohol and Immunization: During several cholera epidemics of the nineteenth century higher mortality rates were noted among excessive users of alcohol than among the abstainers. From this Koch concluded that alcoholic intoxication lowered natural resistance to the cholera vibrio; this conclusion was afterward extended to include other pathogenic micro-organisms.

Lushbaugh of the Department of Pathology of the University of Chicago has recently made tests to study the effects of alcohol on acquired specific immunity in laboratory animals. Active immunity against pneumococci was produced in rabbits by repeated subcutaneous, intra-abdominal and intravenous injection of a formaldehyde-killed-Type I vaccine. After six injections of this vaccine the rabbits yielded sera which agglutinated homologous Type I pneumococci in dilutions as high as 1:1280 (average 1:640).

An additional group of rabbits was immunized passively by intravenous injection of commercial immune rabbit serum given in amounts sufficient to raise their specific agglutinating titre to 1:80. Inoculation tests showed that both methods of immunization afforded adequate protection against 0.1. c.c. of a six to eight-hour broth culture of living Type I pneumococci given intracutaneously. The same dose caused 100 per cent fatalities in control nonimmunized rabbits.

Alcohol was administered orally by means of a stomach tube to 34 actively immunized, 15 passively immunized and 22 nonimmunized rabbits. The usual dose was 50 to 60 c.c. of 24 per cent alcohol, an amount sufficient to produce a stuporous condition bordering on coma. This dose usually raised the alcohol content of the blood stream to 400 to 600 mg. per 100 c.c., which concentration was maintained by giving additional doses of alcohol as needed. Two hours after the intoxication was begun each rabbit together with a nonintoxicated control was given the routine test dose of pneumococci. Of 27 nonintoxicated immune controls only one rabbit died of pneumococcic septicemia, a 3.7 per cent mortality.

Of 49 intoxicated immune rabbits 32 died, a 65 per cent mortality. Both active and passive immunity was therefore almost completely suppressed as a result of two hours of alcoholic intoxication. Differences were noted between the dermal lesions at the site of the test injection in the intoxicated and the nonintoxicated groups. In intoxicated animals the local edema and leukocytic infiltration were reduced, suggesting a suppression of the local inflammatory reaction. Lushbaugh found that the alcoholic lessening of immunity can be partially overcome by a massive (fivefold) therapeutic dose of commercial antiserum. This confirms the current clinical belief that a "double dose" of antiserum is necessary in the alcoholic. (Current Comment, J.A.M.A., Sept. 11, '43.)

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Report on the Use of the Sulfonamides in Third Molar Sockets: In a series of 500 cases in the removal of mandibular third molars, the efficacy of the local application of the sulfonamides was tested.

In the series there were third molars in the following classifications and percentages: (1) partially erupted, 38%; (2) partially erupted and partially impacted, 32%; (3) partially erupted and impacted, 22%; (4) completely unerupted and impacted, 8%.

The same general methods were used in all cases. The anesthetic was the mandibular block. A flap was lifted from the gingival attachment between the second bicuspid and first molar or between the first and second molars, and carried past the third molar and up the ascending ramus by incision as needed for adequate exposure. Bone cutting was done with a fissure bur and when necessary the tooth was split with a chisel.

After removal of the roots, the socket was examined carefully for cystic or unhealthy granulation tissue. Such material was frequently found immediately distal to the second molar in the case of horizontal impactions, and distal to the third molar crown in vertical or disto-vertical instances. When found these masses were eliminated by careful curettage under clear vision. If a bur had been used the bone surface involved was made smooth by a file.

In one half of the cases most of the blood was then aspirated and the socket and retro-molar areas were liberally sprinkled with a powder of equal parts of sulfanilamide and sulfathiazole. The average amount used was from 1 to 2 grams. The remaining 250 cases served as controls. Identical procedures were used except that no sulfonamide powder was applied.

The patients varied in age between seventeen and thirty with 80% or 400 under twenty-three years, so that frequently pericoronitis was encountered. When this was not complicated by active Vincent's infection, the treatment was as in other cases. In pericoronitis the presence of the partially erupted tooth is often the entire cause of the irritation and discomfort, as evidenced by the prompt disappearance of these symptoms with loss of the tooth.

Findings: All patients were seen daily for observation. Among the patients treated with sulfonamide no delayed healing occurred except in the last two subdivisions, i.e. partially erupted and impacted, and unerupted and impacted. Of

those with partially erupted and impacted molars, five patients or 10 per cent required post-extraction socket treatment and of those with unerupted and impacted molars, four patients or 20 per cent needed post-extraction socket treatment. In no case, however, was the pain severe or persistent. In all cases the application of a sedative dressing on gauze controlled it, and cessation followed in a few days.

The control group was very different. Forty-three or nearly 25 per cent of the first two sub-groups complained of mild discomfort within three days of tooth removal, and in the last two sub-groups thirty-nine patients or over 50 per cent experienced the typical discomfort of the dry socket syndrome of earache, dull persisting jaw pain, and denuded socket walls. Where coronitis was present in the control group, the inflammatory irritated condition persisted for several days.

Comment: Five hundred mandibular third molars in various stages of impaction were removed under as identical conditions as possible: the same operator, the same technic, and the same anesthetic agent. In one-half of these the sockets and adjacent involved soft tissue were covered liberally with sulfonamide powder. The other, the control group, received no sulfonamide.

The contrast in character and rapidity of healing in the sulfonamide treated group was striking. The blood clot was more normal in appearance, and when postoperative pain did occur, it was of a milder and less persistent nature than in the control group.

There was no evidence of the sulfonamide acting as a foreign body to interfere with healing. On the contrary, its presence was not detectable after twenty-four hours; instead, the tissues appeared more normal than those which did not receive this form of medication. (G.W.C.)

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Medical and Sanitary Data on India: The following is the summary of an extensive report made by the Public Health Service for the U.S. Army:

Public health, hospital, and medical facilities in India are inadequate for the health and medical requirements of the people. Since the onset of the war, there has been some lessening of the efficiency of these facilities due chiefly to the decrease in trained personnel. Medical supplies and equipment are manufactured in limited quantities; only about 65 per cent of the number of items required can be supplied. Limited amounts of wheat, mutton, beef, fruits, and vegetables may be available in India, but most of the food and dairy products for troops will have to be imported. The inspections given food and dairy products to insure health protection are either lacking or entirely inadequate. Water is plentiful in some areas and scarce in others, but regardless of its source, it should be considered as unsafe for human consumption until adequately treated. Water-borne sewerage systems are found in the largest cities. In most smaller municipalities and towns no community systems for sewage disposal are provided, although septic tanks, bucket systems, or privies may be in use. In the rural areas, even though the Government has encouraged the use of latrines, promiscuous defecation is common, and widespread soil pollution results. India

abounds with mosquitoes capable of carrying malaria, dengue, filariasis, and yellow fever, and other insects, including flies of various types, lice, ticks, fleas, and mites. Centipedes, scorpions, leeches, monkeys, poisonous and non-poisonous snakes, jackals, wild dogs, bears, leopards, tigers, and wild elephants are pests or potentially dangerous animals which vary greatly as to distribution.

The diseases that will be of greatest importance to military forces operating in India are malaria; enteric diseases (typhoid fever, paratyphoid fever, amoebic dysentery, bacillary dysentery, and the common diarrheas); venereal diseases (syphilis, gonorrhea, chancroid, lymphogranuloma venereum and granuloma inguinale); dengue fever; sandfly fever; skin diseases; the acute infectious and contagious diseases (pneumonia, influenza, and meningococcal meningitis); typhus fever; injuries due to heat (heat stroke, heat exhaustion, heat cramps, prickly heat, and heat boils); and relapsing fever. Diseases of potential military importance endemic in the area are cholera, plague, kala-azar, epidemic keratoconjunctivitis, and infective hepatitis. Yellow fever, while not present in India, is a potential hazard in that its vector is present and the disease easily could be introduced from Africa. Serious diseases of nonmilitary importance but likely to affect a small number of troops are tuberculosis, helminthiasis, filariasis, rabies, yaws, and fluke and guinea-worm infections.

In addition to the health and sanitary precautions ordinarily carried out for military forces, the following recommendations are considered of special importance for troops operating in India:

1. Water: All water supplies, regardless of sources, should be considered as unsafe and should be consumed or used for bathing only after proper treatment or after repeated bacteriological tests have proved their safety.

2. Sewage: Dysentery, cholera, typhoid, and paratyphoid fever are endemic throughout India. It is of unusual importance that sewage within Army camps and adjoining areas be carefully disposed of by approved methods. Native employees must be provided with separate toilet facilities and made to use them. Careless soil pollution is hazardous not only because of the resulting contamination of water supplies, but also because of the great number of flies. Although many of the cities have water-borne sewerage systems, they are, for the most part, unable to tolerate additional loads. Consequently, provision must be made for local disposal of sewage, garbage, and other wastes.

3. Fly control: Because of the importance of flies in the spreading of cholera, the enteric diseases, yaws, eye and other diseases, comprehensive fly control measures should be instituted immediately upon arrival and unremittingly carried out.

4. Venereal-disease control: Venereal diseases are prevalent. Professional prostitutes and clandestine contacts are plentiful, all of whom must be considered as being diseased. A venereal-disease program, along with a comprehensive educational campaign and adequate recreational facilities for troops, are urgent necessities. Large supplies of approved prophylactic materials should be provided. Properly staffed and equipped prophylactic stations located so as to be easily accessible to all troops should be established.

5. Malaria control: Malaria is the greatest single disease hazard of India. Approximately 90 per cent of the soldiers engaged in the Burma-East India campaign had malaria. Dengue and filariasis are endemic. Mosquitoes capable of carrying yellow fever are widespread. Mosquito-borne diseases, while transmitted throughout the year in most sections of India, are more prevalent in the summer and fall. Mosquito-control measures are urgently required and must be energetically and unremittingly carried out. Control measures should include:

(a) The use of bed nets (sandfly mesh), issued as individual equipment at the zone of the interior port of embarkation, and thus available for use immediately upon arrival.

(b) The liberal use of insect repellents.

(c) The use of head nets, gloves, leggings, and other protective clothing.

(d) If possible, the location of camp sites on high ground, preferably one or two miles from important breeding places and native habitations, barns, cow sheds, and other inhabited buildings so as to be beyond the effective flight range of mosquitoes.

(e) If for military reasons it is necessary to make permanent camp sites in areas in close proximity to native villages, consideration should be given to moving these villages to other locations.

(f) Thorough screening of all tents and buildings which are to be occupied in the evenings or at night (barracks, mess halls, post exchanges, theatres, offices). Entrance vestibules with screened doors at both ends (mosquito lock), will prove invaluable in excluding mosquitoes from buildings.

(g) The use of pyrethrum sprays in native habitations, barns, and cow sheds within mosquito flight range of camps (one to two miles), and in all tents, barracks, mess halls, recreational and other buildings. The new Freon aerosol insecticide cylinder is recommended.

(h) Clearing, draining, and filling where possible.

(i) Oiling and application of Paris green where indicated.

(j) An adequate supply of antimalarial drugs sufficient for 100 per cent suppressive treatment should be available for use at the discretion of the surgeon. In some sections, suppressive treatment will be required during all months of the year, while in other areas such treatment will be required only during the summer and fall months.

6. Sandfly control: Sandfly fever, oriental sore, and kala-azar, all of medical military importance, are carried by sandflies. The control of these diseases lies largely in the control of sandflies. Such measures should include:

(a) The use of sandfly mesh (bed nets).

(b) The liberal use of insect repellents.

(c) The avoidance of sleeping in darkened rooms in the daytime without use of insect repellents or a bed net.

(d) Tents, if possible, should not be pitched on rocky slopes or near stone walls, loose damp gravelly ground, or mud or stone native houses.

(e) Only well-built barracks, with concrete floors or closely fitting boards and inside walls without cracks, should be used.

(f) Collections of rubbish, wood, and loose rock, etc., should not be allowed to accumulate on or about camp sites.

(g) The use of a pyrethrum insecticide, preferably the new Freon aerosol cylinder as used for mosquito control, will also destroy sandflies.

7. Sanitation and control of food handlers: If local eating establishments are used by military personnel, thorough inspection of these places, including those vending soft drinks and dairy products, should be carried out in order to determine those that can be considered acceptable. Organizational commanders and surgeons should carry out comprehensive educational programs as to the dangers of eating in other than approved establishments or in native homes. Liberal use of the out-of-bounds procedure is justified as regards unsatisfactory eating places. Because of the hot climate and the high incidence of intestinal infections, unusual care must be exercised in the selection, storage, and preparation of food in Army messes and post exchanges.

8. Control of injuries due to heat: Control measures should include the following:

(a) Clothing of the proper type should be loose, and shoes should not fit too tightly. Proper sun helmets and sun glasses should be worn at all times when exposed to the sun's rays.

(b) Adequate rest periods should be allowed preferably at frequent short intervals during the day.

(c) Diet should include liberal amounts of cooked fruits and vegetables and fruit juices. During the heat of the day only light meals should be eaten.

(d) Liberal amounts of water should be given at frequent intervals. The amount required per individual varies from one-half gallon for the resting individual to three gallons for one working throughout the day. Alcoholic drinks should be avoided until after sundown.

(e) Additional salt will be required to provide for that lost in perspiration. The addition of table salt to drinking water to make a one-tenth per cent solution is advised for drinking purposes. Such water can be obtained by adding one pound of table salt to one hundred gallons of water or by adding one-fourth teaspoonful of table salt or two 10-grain salt tablets to each canteen of water.

(f) Troops should be instructed in the early warning signs of heat stroke and heat exhaustion and the necessity for complete rest and medical care in the event these signs and symptoms appear.

9. Cholera control: Because of the endemicity of cholera and the ease with which it could appear in epidemic form as a result of the breakdown of the usual quarantine and sanitation facilities, preventive measures against this disease are indicated. The procedures outlined for the protection of food and water in paragraphs 1, 3, and 7 are applicable. Immunization is required, and booster doses of 1 c.c. may be required at the end of four or five months. Examination of food handlers for the detection of carriers is recommended. Troops should be instructed as to the possible sources of this disease and as to the methods of its prevention. (See paragraphs 1, 3, and 7.)

10. Control of flea-borne diseases (murine typhus fever and plague): Rodents and fleas are prevalent. Plague and flea-borne typhus fever and other diseases carried by rodents are endemic; therefore, all temporary, semi-permanent, and permanent buildings should be of rat-proof construction and rat-control programs should be enforced in all camps. Native public buildings, habitations, and warehouses should be considered as harboring rats and other vermin and therefore unfit for living quarters or offices without preliminary sanitation. Immunization against plague is not recommended prior to arrival in India. Adequate stocks of plague vaccine should be available for use as a control measure in the event of plague outbreaks among the civilian population.

11. Control of mite-borne typhus fever: This disease occurs more commonly during the autumn months, chiefly in northern, eastern, and southern India among those coming in contact with coarse grasses or engaged in clearing jungle land or trails. Troops working in such areas should be furnished with insect repellent powders and should be made to understand thoroughly the necessity of wearing protective clothing, frequent change of clothing, and frequent bathing.

12. Control of louse-borne diseases (typhus fever, relapsing fever): Louse-borne typhus and relapsing fever are more common in northern and western India where human lice are especially prevalent; therefore, it is recommended that equipment for delousing clothing and beds, and facilities for disinfestation of personnel should be made available for all components of a force contemplated for this region. Vaccination against typhus fever is in accordance with present War Department policy. These immunizations must be completed prior to departure.

13. Control of tapeworm and fluke infections: Beef and pork may contain the cercariae (worms) which cause tapeworm infections in man. If such meat is eaten raw or without being sufficiently cooked, tapeworm infestations may occur.

Likewise, crustaceans, fish, and types of nuts grown in water may contain the cercariae of the flukes which cause fasciolopsiasis, paragonimiasis, and gastrodiscoidiasis. The ingestion of uncooked or undercooked crustaceans or water nuts, or water containing living cercariae will result in these fluke infestations. Wading, bathing, or swimming in waters infected with cercariae also may result in fluke infections.

All personnel should be properly instructed as to the danger of consuming beef, pork, fish, crustaceans, or water nuts which have not been thoroughly cooked, or of drinking improperly prepared water, or wading, bathing, or swimming in such water.

14. Control of dracontiasis (guinea-worm infections): Water supplies in large sections of India are infested with cercariae of the guinea-worm and with water fleas which are infected with the cercariae. The ingestion of such water may result in guinea-worm infection. Therefore, all personnel should be carefully instructed as to the dangers of consuming water not known to be free of these parasites.

15. Control of hookworm: Hookworm infestation is widespread in India. The wearing of shoes, the locating of camps on sites not recently used for native habitations, the sanitary disposal of excreta, and good personal hygiene will do much to prevent hookworm infestation.

16. Control of leeches: Leeches are prevalent in the jungles and are commonly encountered in brush and overhanging limbs along jungle trails. Troops should understand the dangers from blood loss and secondary infections resulting from the bites of these parasites as well as the proper methods of removing the leeches once they are attached; i.e., touching with damp tobacco, salt, or the lighted end of a cigarette. Preventive measures include the wearing of protective clothing and boots, the avoidance of vegetation where possible and the regular examination of clothing and skin to remove promptly any leeches which might be attached there.

17. Control of snake bites: Poisonous snakes are plentiful in the rural and jungle areas. Troops should be instructed as to the distribution and habits of these snakes and in the first-aid procedures which they can carry out in the field. (FM 21-11)

18. First-aid treatment of wounds: All personnel should be thoroughly indoctrinated with the necessity for giving immediate first-aid treatment to all wounds, burns, abrasions, and insect bites, regardless of size. (The Army M. Bull., July '43.)

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Research Projects: The following projects have been completed at the Naval Medical Research Institute during the month of August:

Report on Night Vision: Test and Night Lookout Training with the Amphibian Forces, Ocean View, Va.

Project X-127. Summary of Tests on Life Raft Equipment Conducted by the Naval Medical Research Institute in the Gulf of Mexico. Report No. One.

NMRI-10. Protectite, Toxicity and Fungistatic Properties.

NMRI-9. Plastic Water Container.

Project X-189. Protective Clothing for Subjects Immersed in Cold Water. Report No. Two.

NMRI-13. Captured Enemy Equipment: Two Cans of Rations.

NMRI-15. Captured Enemy Equipment: Stretcher, Headgear, Leggings and Blankets.

NMRI-11. Captured Enemy Equipment: Japanese Dried Vegetable Material.

Project X-104. Studies on Agglutinin Titers of Pooled Plasma. Report No. Two.

Project X-127. Appraisal of Some Devices for Obtaining Drinking Water from the Sea under Actual Conditions on Inflatable Life Rafts. Report No. Two.

Reports will be sent to interested medical officers upon request to the Naval Medical Research Institute, Bethesda, 14, Maryland.

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Public Health Foreign Report:

Disease	Place	Date	Number of Cases
Plague	Dakar, Fr. West Africa	July 21-31, '43	1 (fatal)
	Cochinchina, Indochina	July 21-31, '43	1 (fatal)
Smallpox	Algeria	July 11-20, '43	39
		July 21-31, '43	30
	Brazil (Salvador)	Apr. 3-10, '43	2
	Indochina	July 11-20, '43	107
		July 21-31, '43	111
	Turkey	June 1943	719
		July 3-10, '43	150
		July 10-17, '43	133
		Aug. 1-15, '43	283
Typhus Fever	Algeria	July 11-20, '43	94
		July 21-31, '43	115
	Hungary	Aug. 1-7, '43	6
	Rumania	Aug. 7-21, '43	84
	Slovakia	July 24-31, '43	7
		Aug. 1-7, '43	22
	Spain	June 19-July 3, '43	25
		July 3-10, '43	11
	Tunisia	July 11-20, '43	50
	Turkey	June 1943	785
		July 3-10, '43	113
		July 10-17, '43	93

Public Health Foreign Report (Cont.):

Disease	Place	Date	Number of Cases
	Turkey	Aug. 1-15, '43	206
Yellow Fever	Brazil (Ponta De Pedras)	July 8, '43	1 (fatal)
	Nigeria - Makurdi	July 22, '43	1

(Pub. Health Rep., Sept. 3 & 10, '43.)

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Erratum: The reference for the item entitled "Microbes in Natural Habitats" which appeared in the Bumed News Letter, Vol. 2, No. 6, p. 7, should read "Current Comment, J.A.M.A., July 31, '43."

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The Sterilization of Drinking Water in Canteens by the addition of 3 drops of 7 per cent tincture of iodine was mentioned in the News Letter of July 23.

The following is an excerpt from the letter of a medical officer now serving with the forces afloat (Kimbrough):

"After the iodine has been added to the water in the canteen, the mixture should be thoroughly agitated. At the expiration of the sterilization period," (15 minutes) "a 10 per cent aqueous solution of sodium thiosulphate should be added. This is measured and the same number of drops used as tincture of iodine. The mixture is agitated and the color, odor, and taste of iodine disappear at once. Thus stronger concentrations of iodine may be used if desired."

The letter was referred to the staff of the Naval Medical Research Institute for opinion, and a favorable comment was received: "Sodium thiosulphate neutralizes iodine just as it does chlorine. The method is sound. Theoretically it would take about three instead of two drops of 10 per cent sodium thiosulphate to neutralize two drops of tincture of iodine. Super-iodinization-de-iodinization is every bit as good as super-chlorination - dechlorination as now recommended, and may even be more valuable because of the availability of iodine in places where there is no calcium hypochlorite."

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Effect of Intramuscular Injection of Atabrine: Hawking reported that histological examination of the tissues of rats and rabbits, after subcutaneous and intramuscular injection of atabrine musonate, always showed a certain amount of necrosis at the site of injection. The damage produced by the atabrine is similar in character to that caused by the injection of quinine, but less than one-third as extensive. The author concludes that, though these findings do not contraindicate the parenteral use of atabrine in patients who cannot take it by mouth, they should be borne in mind. (Brit. M. J., Aug. 14, '43.)

BUREAU OF NAVAL PERSONNEL

Pers-319-HBS
P18-1/00

23 Sep 1943

CIRCULAR LETTER NO. 196-43

To: All Ships and Stations

Subj: Convalescent Leave for Officers

1. The following letter from the Secretary of the Navy is quoted for the information and guidance of all concerned.

L. E. DENFELD
Rear Admiral, USN

THE SECRETARY OF THE NAVY
Washington

From: The Secretary of the Navy.
To: Commandants, Naval Districts.
The Medical Officers in Command, All Naval Hospitals in the United States.

Subject: Establishment of Convalescent Leave Status for Officers.

1. A status of convalescent leave for officers is hereby established for the duration of the war.

2. Convalescent leave not to exceed thirty (30) days may be granted to officer patients by medical officers in command of U.S. naval hospitals under the following circumstances:

a. The officer is under treatment for an illness or injury which has necessitated his evacuation from overseas or which was incurred aboard ship under combat conditions.
b. He is no longer in need of active treatment in a hospital but has not fully recovered and is not fit for duty.
c. A period of convalescence with his family can be expected to hasten his recovery and return to duty.

3. Medical officers in command of naval hospitals are authorized to grant such officers permission to report to the naval hospital near to their homes upon expiration of convalescent leave.

4. Orders granting convalescent leave shall in each case specify the naval hospital to which the officer is to report upon expiration of his leave and shall contain the following statement:

"This authority is granted with the understanding that you will be entitled to no mileage or expense. In case you do not desire to bear this expense, return this letter for cancelation."

The health record, and in the cases of officers of the Navy, the pay accounts, shall be closed and forwarded to the hospital to which the officer will report upon expiration of his leave in time to arrive prior thereto. A copy of the letter authorizing convalescent leave shall in each case be forwarded to the Bureau of Naval Personnel or Commandant, U.S. Marine Corps, as appropriate, and to the Bureau of Medicine and Surgery.

5. Since to be eligible for convalescent leave, officers must have suffered from conditions severe enough to necessitate their evacuation from overseas, they will in all cases be brought before a board of medical survey when fully recovered and fit for duty. Orders to their next duty will be issued upon the approval of the board of medical survey's recommendation that they be returned to duty.

6. Officers who require a period of convalescence longer than thirty (30) days should be recommended for sick leave by a board of medical survey.

7. Convalescent leave will not be granted to officers who are admitted to a hospital from their place of duty in the United States or to those who are permanently disabled. In such cases leave or sick leave and authority to transfer to other naval hospitals for continuation of treatment should be requested in accordance with established procedures.

JAMES FORRESTAL
Acting